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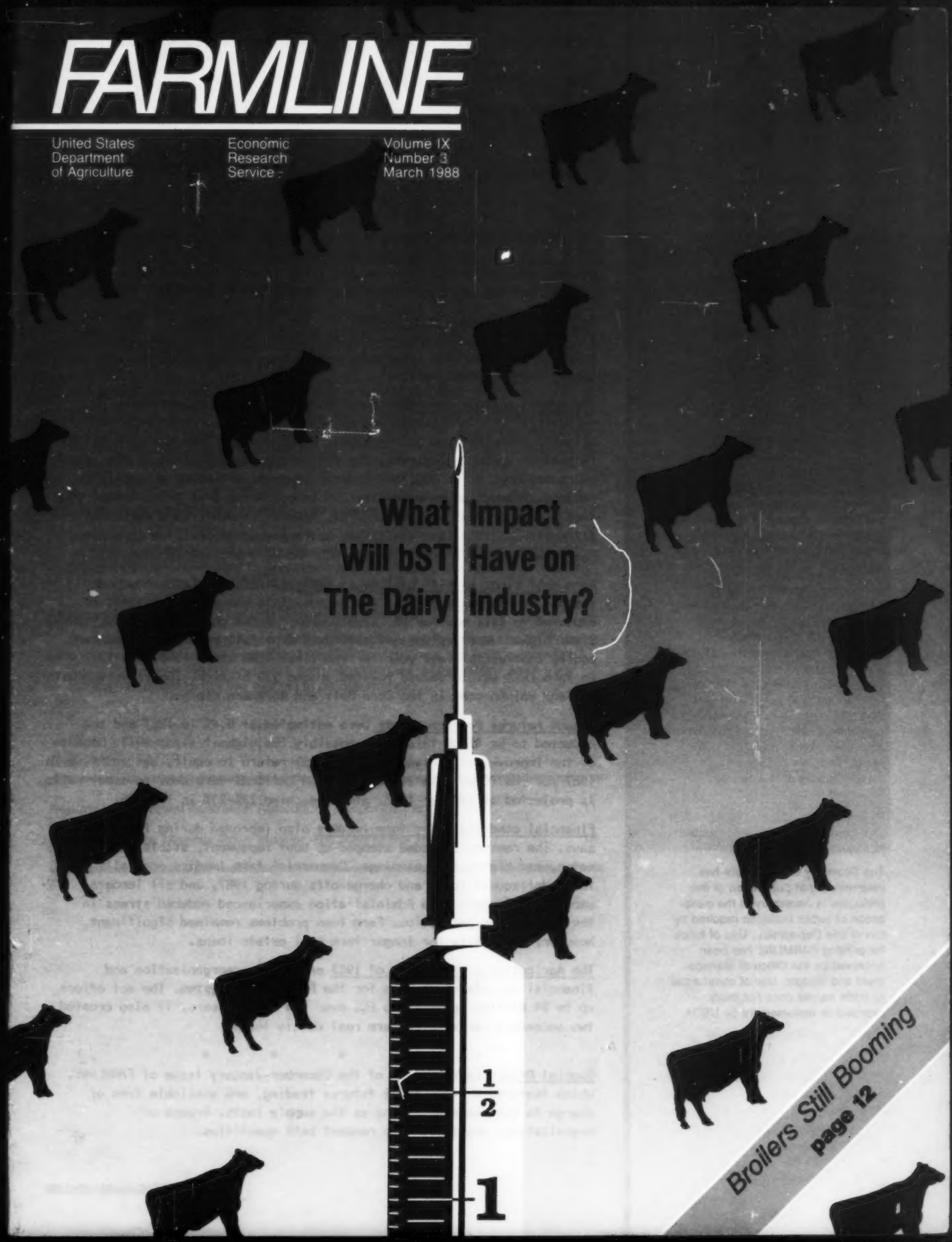

What Impact Will bST Have on The Dairy Industry?

Broilers Still Booming
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PERSPECTIVES

THE OVERALL FINANCIAL CONDITION of U.S. agriculture improved during 1987, with land values increasing an estimated 3%-5% and farm debt declining by about 9%. This was the first rise in farmland values since 1981-82 and the fourth straight year of decline in farm debt.

Net cash farm income rose in 1987 for the third consecutive year, to $57 billion. The main reasons? Large federal payments, lower operating costs, a good year for livestock, and some price recovery for corn, wheat, soybeans, and cotton.

The income outlook for 1988 is not quite as bright, according to USDA economists. Net farm income and net cash farm income could both decline slightly from last year's new highs. Livestock earnings are expected to fall after 2 years of growth, the production cost declines of the last 3 years may come to an end, and federal supports are being gradually reduced. Production expenses fell to an estimated $118 billion last year from a peak of $143 billion in 1984. Federal payments were estimated at $17 billion in 1987 and are likely to be around $15 billion this year. The totals were $11.8 billion in 1986 and $7.7 billion in 1985.

Farm debt stood at $141 billion in 1987, $51 billion below the peak reached in the early part of the decade. This year the debt total is expected to fall another 8%, says Economic Research Service analyst Jerry Stam. Higher asset values and continued debt retirement increased farm equity (net worth) last year for the first time since 1980. The 1987 hike in farm real estate values totaled around $20 billion. The largest boosts in land values came in the Corn Belt and Northern Plains.

Income returns to farm assets were estimated at 5.4% in 1987 and are expected to be 4%-6% this year, possibly the highest since 1973. Because of the improvement in land values, total return to equity was positive in 1987 for the first time since 1980. The national farm debt-to-asset ratio is projected at 19% for 1988, after reaching 22%-23% in 1984-86.

Financial conditions for farm lenders also improved during 1987, Stam says. The reasons included stepped-up debt repayment, stable interest rates, and higher farm earnings. Commercial farm lenders generally had fewer delinquent loans and charge-offs during 1987, and all lenders except the Farmers Home Administration experienced reduced stress in their farm loan portfolios. Farm loan problems remained significant, however, especially for longer term real estate loans.

The Agricultural Credit Act of 1987 provided a reorganization and financial assistance package for the Farm Credit System. The act offers up to $4 billion in loans to FCS over the next 4 years. It also created two secondary markets for farm real estate loans.

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FARMLINE

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The Impact of bST on the Dairy Industry *by Juliana King* 4

Synthetically manufactured bovine somatotropin (bST) is the latest technological advance in dairying. And, as usual, technology's benefits could be accompanied by unforeseen impacts. The possible effects of bST on milk production, surpluses, and government policies are being carefully analyzed.

More Farmers, Ranchers Trying 'Alternatives' *by Neill Schaller* 8

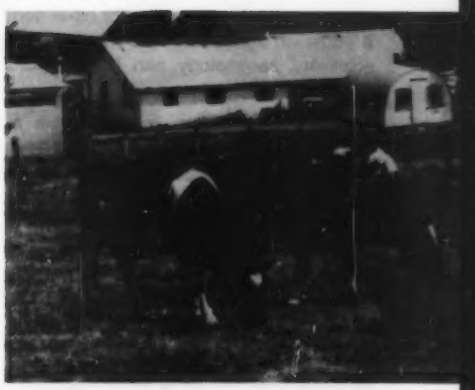
Economics is one of several reasons for increased interest in "alternative agriculture" in this country. Farmers and ranchers are exploring different production methods as well as new crop and livestock enterprises. In this article, economist Neill Schaller discusses some of the recent trends, and where they may be heading.

U.S. Broiler Industry Is Still Expanding *by Juliana King* 12

Consumption of chicken continues to increase, and broiler production keeps expanding. A few large firms dominate the highly integrated, efficiency-conscious broiler industry. Their ability to hold down costs and respond quickly to changing consumer preferences helps explain their success.

Effects of Immigration Law Uncertain *by Doug Martinez* 16

Growers who have depended on foreign farmworkers to harvest perishable crops are concerned again this year about the effects of the new U.S. immigration law. No widespread, labor-related crop losses were apparent last year, but the full impact of the law has yet to be determined.



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The Impact of bST on the Dairy Industry

For the dairy industry, as for other sectors of agriculture and the general economy, technology can be a mixed blessing.

In the last 50 years, improvements in genetics and nutrition resulted in better bred cows eating better balanced rations. New vaccines and medicines, better herd management, and better record keeping also resulted in greater productivity, reflected in sharp gains in milk output per cow. And new bulk tank facilities, refrigeration, and transportation improved the industry's ability to ship and store milk.

But continued technological change has a controversial side. Technology's benefits are accompanied by often-unforeseen impacts on industry structure, including the size and number of dairy farms, as well as on supplies, prices, and producer profits. Increased efficiency and production are also reflected, at least partly, in the large and costly surpluses of dairy products held by the government.

Now yet another technological advance—synthetically manufactured bovine somatotropin (bST)—has the potential to raise per-cow output at least 10 percent. With that increase comes concern about more change within the industry, even greater surpluses, and further pressures on government dairy policy.

The concern may be overstated. According to economists with USDA's Economic Research Service, bST will not dramatically alter the direction in which the dairy industry is already headed.

What likely will happen instead, says economist Richard Fallert, is that the industry will continue its move toward fewer and larger farms, perhaps at a slightly faster rate. And overall production will continue to depend more on price supports, dairy programs, and consumer demand than on milk output per cow.

A recent study by Fallert, his ERS colleague Carolyn Betts, and economists Tom McGuckin and Gary Bruner of New Mexico State University, indicates the effects of bST will likely be less dramatic than often suggested.

Use of synthetic bST will not dramatically change the direction in which the dairy industry is already headed.

"bST will be available to all dairymen at a relatively small cost, and while large, well-managed operations may be the first to adopt it, it will also benefit small and medium-size farms. Furthermore, the move toward a more concentrated dairy sector will continue even if bST is not instituted as a routine farm practice," Fallert says.

Nevertheless, bST will likely benefit well-managed herds more than others since successful use of the product depends on proper management, nutrition, and health care. And larger farms are generally the ones that most often provide such management, Betts points out.

bST's Arrival on the Scene

But what is bovine somatotropin? It is a protein that is naturally manufactured by the bovine endocrine system and contributes to milk production. If the synthetic version is approved by the Food and Drug Administration for use in dairy cows, bST may be commercially available to dairymen as a milk production stimulant as early as 1990. This bST technology breakthrough, which boosted milk output as much as 40 percent in research studies, comes "on the heels of several decades of change that has resulted in advances that improved the industry's efficiency immensely," says Fallert.

"Bulk milk handling facilities and equipment, silo unloaders, and improved milking equipment in the 1950's cut dairy farm labor requirements and saved farmers time and money. Increased concentrate feeding, better nutrition, higher quality feeds, and improved health care have also contributed to greater cow productivity over the past 25 years. In addition, artificial insemination, progeny testing, and most recently, embryo transfer, have upped the quality of the genetic cow base and resulted in higher producing cows," he says.

One measure of that improvement, the average amount of milk produced per cow each year, has more than doubled from 5,842 pounds of milk in 1955 to 13,850 pounds in 1987, according to ERS data.

Yet, these same factors, in conjunction with relatively high dairy price supports, contributed to the industry's current surplus woes. Despite bST's promise of even greater efficiency, its impact on the industry remains controversial.

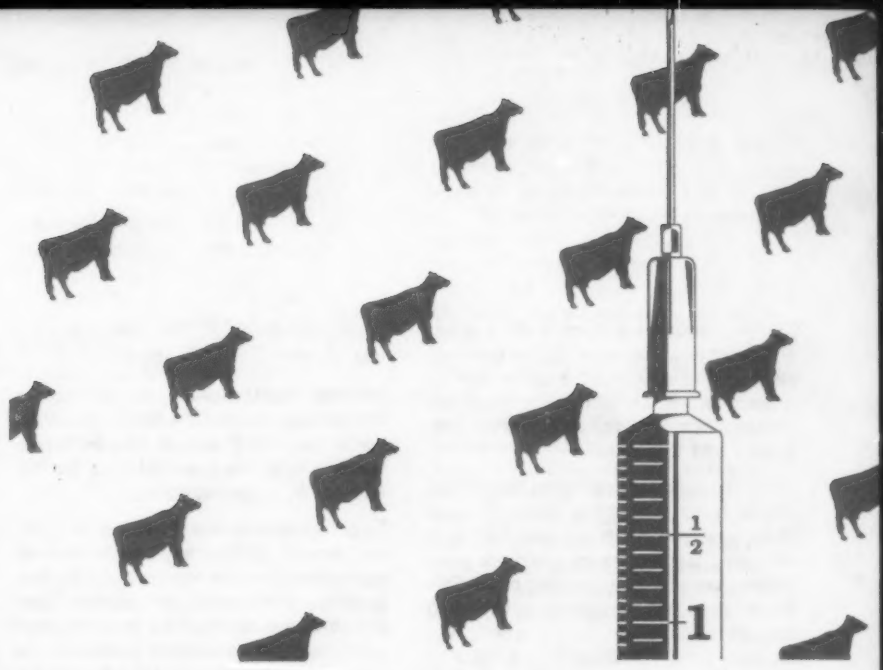
Public concern over bST's safety is still an issue even though research shows that milk and meat from treated cows are safe for human consumption. Dairy scientists point out that bST is specific to cattle. In other words, it does not affect most other species, including humans. Furthermore, the process used to synthetically produce the stimulant employs a harmless strain of E-coli bacteria, which is removed after the bST is produced.

Consequently, consumer distrust of bST may be limited and commercial demand for milk should not decline as a result of its use. The economists are quick to point out that if negative publicity concerning the safety of milk from bST-treated cows occurs, it could hurt dairy product demand. However, it is more likely that if bST results in lower milk prices, dairy product consumption could increase, says Fallert.

Another concern is that surplus dairy stocks may become even larger if bST is used. This could be very costly. Federal stocks topped 16.6 billion pounds (milk equivalent basis) in 1982. In 1986, USDA held more than 5.4 billion pounds milk equivalent, and last year, approximately 6 billion pounds.

Since the first dairy program was initiated in the early 1930's through marketing agreements, federal assistance for the industry has evolved into an extensive and costly system. Today's price support and adjustment program is based on World War II legislation designed to ease the transition from war-inflated demand back to peacetime levels.

The system supports milk prices at the farm level through USDA purchases of



non-fluid milk products like butter, cheese, and nonfat dried milk. The surplus is held by the Commodity Credit Corporation and is distributed through the federal School Lunch Program and other domestic or export food programs. The stocks can also be sold on the domestic market when the market price reaches 110 percent of the government's purchase price.

What this program has meant for farmers is a reliable price for their milk. It also has periodically resulted in larger surpluses. The reason, say the economists, is that the federally set supports are sometimes established—as they were in the late 1970's and early 1980's—above prices that stabilize production. The result is the program pays the farmer a higher price for his milk than he would receive on the open market. This stimulates production to exceed commercial needs and normal government program uses, and consequently, creates surpluses.

Congress has attempted to ease the surplus problem several times, but such programs—reducing dairy production over the short-term—were less effective over the long-term, say the economists. For example, the dairy diversion program of the early 1980's resulted in a temporary downturn in surplus stocks but had virtually no long-term impact on the number of cows producing milk in the United States.

Even the recent Dairy Termination Program—part of the 1985 farm bill—may have only temporary effects. ERS analysis shows that the program successfully reduced the size of the dairy herd by more than 1.2 million head, says ERS colleague Terry Crawford. Now, however, there is evidence suggesting that the dairy herd is stabilizing.

Since the total U.S. milk supply depends on the number of cows in production and the amount they produce, introduction of bST will likely affect milk supplies by raising milk production per cow, according to the analysts. If the stimulant is adopted at a rapid rate, milk supplies could increase to the point where there is a decrease in milk prices, which could lead to a reduction in cow numbers or a rise in government purchases, explains Betts. Yet the economists stress that bST will not necessarily exacerbate the surplus problem if accompanied by a flexible dairy price support program.

The adoption of bST may be quite rapid since it is relatively simple and economical to use and because it yields quick results. However, as Fallert points out, a number of things could slow adoption rates. There is still uncertainty about the long-term effects the stimulant may have on treated cows. Studies show that reproduction is inhibited when bST is injected during the first 90 days of lactation. This is the period of peak lactation during which the cows are also being bred. It will likely be recommended that farmers employ the drug only after the peak is past and cows have conceived. In fact, most of the research on the product's effectiveness called for the bST treatments to be administered after 90 days of lactation, says Fallert.

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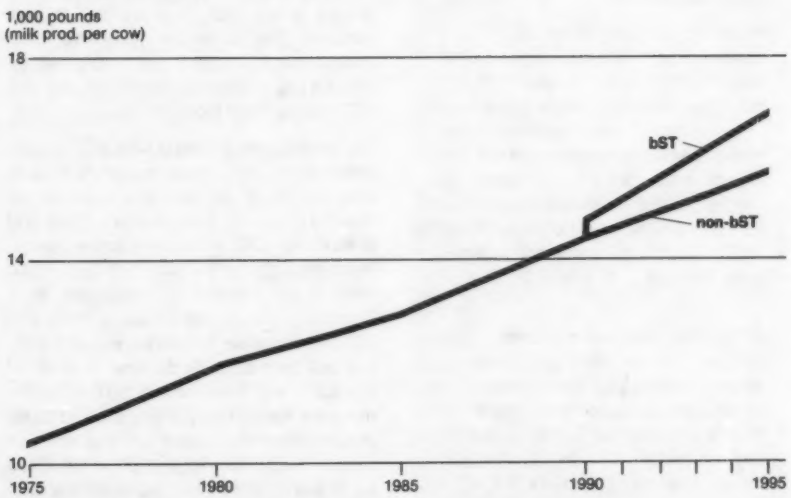
bST Use Should Continue the Annual Increases in Milk Production per Cow at a Slightly Accelerated Rate*



*Projections are based on a $10.10 per cwt. support price for milk.

The economists say there is still a question about how the use of bST on commercial farms will differ from the use of the drug under controlled laboratory tests on research herds. This could also affect how quickly bST is adopted.

The "real world" of dairy farms differs from research herds in many ways. For one thing, research herds are generally well managed, well monitored, and made up of higher than average producing cows. This is not to say that commercial farms fail to meet these standards, but the extent of the increase in milk production as a result of bST will depend greatly on the management expertise of the farmer, says Fallert.

For instance, the farmer who administers bST but who fails to adjust the feed ration to ensure that his cows' nutrient needs are met will not have good results.

Likely bST Payoff Varies by Region

Use of synthetically produced bovine somatotropin (bST) could increase net returns with as little as a 3-pound per day boost in milk production if the treatment costs less than $8.00 a month per cow, says Carolyn Betts, an economist with USDA's Economic Research Service.

However, the breakeven costs—which are affected by the price of milk and the costs of feed, veterinary supplies and services, and other inputs—vary by region. At the 3-pound per day response level, producers in the Southern Plains could pay up to $8.99 a cow monthly for bST and still have an increased net return. However, producers in the Corn Belt could pay only $7.38 a cow monthly.

In general, operations in the Southern Plains and Lake States could afford to pay the highest prices for bST at all response levels. Producers in the Corn Belt and Pacific regions could afford to pay the least for the treatments, the economist says.

National Implications

The economists say the many unknowns concerning the effects of bST on the industry emphasize the need for a flexible national dairy pricing policy.

To get a better picture of how bST may affect the U.S. milk supply and the federal government's management of it, the analysts developed four scenarios. They first studied what would happen if the support price for manufacturing grade milk was cut to $10.10 from $11.10 a hundredweight (cwt) by 1990, with no further adjustments over the next 6 years.

Using these assumptions, they concluded that bST would not affect overall cow numbers, but that government purchases of milk would rise by about 8 billion pounds annually. The reason, they say, is that bST would cause an 8-percent increase in milk production during the 6-year period. Milk production would increase 4 percent under the same circumstances even if bST was not available. High, inflexible supports would channel this added increase in production into government purchases.

The second scenario set the minimum milk support price at $9.60 per cwt by 1990. The results would include a decline in cow numbers. The increase in government purchases would be less, but would still be about 8 billion pounds more annually with bST than without it over the 6-year period.

Under the third scenario with bST in use, government purchases would decrease. The minimum support price would be allowed to drop to $9.60 a cwt by 1990, and to $8.60 by 1992. More dairy farmers would leave the industry and cow numbers would decline 12 percent in response to a 9-percent drop in milk prices by 1996 with bST. Government purchases would initially rise but then steadily decline. A study of the same situation without bST indicates the price support would stay around $9.60 per cwt since the level of government purchases would not trigger a price reduction as it would with bST. Government purchases would be about 2 billion pounds lower than they would be with bST in use.

The last scenario would maintain the support price at the late 1987 level of $11.10 a cwt. This would help financially stressed farmers stay in business, the analysts say. It would also yield the most costly program for the government. If the industry used bST under this scenario, milk production could hit 178 billion pounds annually by 1996. Federal purchases would climb because the support price would encourage farmers to keep their cow numbers high. Total government purchases would reach 31 billion pounds by 1996. If bST was not in use, production would reach 162 billion pounds annually, and government purchases 16 billion pounds by 1996.

The last scenario, says Fallert, underlines the need for a policy that would allow milk price supports to adjust to changes in the market. A flexible dairy price support system that would adjust levels downward as unit costs decline and supplies increase—like those in the first three scenarios—would not only lower prices to consumers and lower government costs, but also allow the industry to adjust to its own changes. Under such a proposal, farmers would receive lower prices for their milk, partially offsetting the lower cost of producing milk with bST. This would reduce the incentive for farmers to increase production.

"Consumers will benefit from the improved efficiency gained by the use of bST if price supports are allowed to fall to balance production and use. In the longer run, U.S. dairy farmers will also benefit since milk and dairy products will be more competitive with other foods. Furthermore, if more liberal dairy policies are implemented worldwide, the United States would become more competitive in the global dairy market," Fallert says. □

[Based on information provided by Richard Fallert, Carolyn Betts, Terry Crawford, John Ginzel, Ron Gustafson, Jim Miller, and Richard Stillman of the Commodity Economics Division, Economic Research Service.]

Herd Buyout Program Had an Influence on Production

The Dairy Termination Program (DTP), implemented by the 1985 farm bill, has been another significant, recent influence on U.S. milk production. The program caused a rapid drop in milk output during the 18 months it was in effect. But questions remain about its long-run effectiveness.

Data from USDA's Economic Research Service show that in the fourth quarter of 1986—the second quarter of the program—milk production dropped 4 percent below the 1985 level. That decrease is in sharp contrast to the 8 percent rise in production in the first quarter of 1986, before the program started, says ERS economist Terry Crawford.

More importantly, the analyst adds, the program stemmed the upward trend in milk production that has been seen for the past several years. Production increased less than 1 percent in 1986, compared with 5.7 percent in 1985 over 1984 levels. During April, May, and June of 1987, production was down 2.6 percent from the previous year, he says.

The decrease in production during the program resulted in a substantial rise in the price of milk in the second half of 1986. But because milk production was lower, purchases by the Commodity Credit Corporation dropped sharply to 5 billion pounds in 1986-87, less than half the previous year, according to Crawford.

But the questions and controversies concerning the program's overall effectiveness, as well as the effect it had on other agricultural enterprises, are many. Part of the concern focuses on whether the program affected producers who were in good financial shape and who planned to continue dairying for a long time. According to the economist, DTP participation appears to have been dominated by farmers who planned to leave the industry anyway.

"Generally speaking, the characteristics of those who participated in the dairy herd buyout indicate that they would probably have left the industry within 5 years, even without the program. Producers who had older facilities, or had attractive alternatives to dairying, were the most likely to enter a low buyout bid and consequently be accepted," Crawford explains.

Nevertheless, the program did, at least temporarily, cut milk production. It did so by reducing the number of cows producing milk without serious, prolonged effects on the profitability of red meat production, says the economist. This is important because of questions raised, particularly by the beef industry, about the effect the dairy herd buyout had on other agricultural sectors.

The beef industry was concerned that the slaughter of surplus cows would flood the red meat market, drive down the retail price of beef, and consequently hurt the industry's net returns. At issue was whether USDA—which was mandated by Congress in the 1985 legislation to purchase the surplus meat generated by the program—would purchase enough of the extra supply to maintain the prices paid for beef at that time.

Indeed, the price of beef—especially for utility cows, the category which covers most dairy cows—dropped. However, most of the effect on beef prices attributed to the buyout occurred in April 1986—immediately after the program was announced, says Ron Gustafson, another ERS economist. Prices for utility cows fell from an average of $38 a hundredweight (cwt) in February and March to the low $30's in the second week of April. It was during that week (April 14) that the government started to purchase the surplus, and the market quickly returned to $38 a cwt.

The 1985 legislation required USDA to buy 400 million pounds of red meat to offset the increased supplies due to the dairy slaughter. Most of the government purchases were completed in August. The preliminary total exceeded 430 million pounds product weight basis, Gustafson says.

One other question concerning the results of the buyout centers on whether cows enrolled in the program were actually removed from production, either by slaughter or export. The official, federally inspected DTP slaughter—which does not cover all slaughter—appears to fall short of the level originally expected, says Gustafson. But much of the variation between intended DTP slaughter and federally inspected slaughter can be accounted for, he adds.

First of all, DTP slaughter figures were collected by the Food Safety and Inspection Service only in federally inspected plants. The figures do not account for other commercial slaughter or for cows that were slaughtered on farms. If the commercial count is added in, the slaughter total comes to 1.28 million head, leaving a shortfall of 139,612 cattle from the expected number.

Secondly, DTP slaughter figures prior to April 1986 are not available. As many as 45,000 head may have been slaughtered during that time, according to Gustafson. Death losses may also account for some of the discrepancy, since the death of a cow intended for slaughter would not have been included in the slaughter numbers. Assuming a death rate of 2 percent, the difference between intentions and federally inspected slaughter could be reduced to 32,000 to 35,000, the analyst says.

A third contributor to the difference is that the numbers may not reflect cattle in herds that were pulled from the program after producers changed their minds, appealed their bids, and were released from their contracts.

Finally, compliance data from the Agricultural Stabilization and Conservation Service (ASCS) on slaughtered and exported animals have yet to be assembled and analyzed. "Once we know more about these data, we will get a better picture about the total, real slaughter," says Gustafson.

"The effects of the dairy herd buyout will fade with time. Undoubtedly, the program reduced production, and probably government costs. But in the long run, future production will depend on how producers respond to milk price support levels," he adds.

More Farmers, Ranchers Trying 'Alternatives'

The hard times that have plagued much of U.S. agriculture during recent years have resulted in an increasing number of changes, with some farmers and ranchers turning to new production methods and new crops. Economist Neill Schaller of USDA's Economic Research Service has been following trends in alternative agriculture. He reports here on some of those trends.

More and more farmers across the country are farming differently today. They're cutting back on purchased fertilizer and pesticides, using more or different rotations, and trying different crop and livestock enterprises.

These farmers are practicing "alternative agriculture," and their neighbors are watching with growing interest.

Economics is one factor influencing these changes. Many farmers and ranchers have been under strong pressures to cut their input costs. This often has meant altering traditional production methods. Other factors that have encouraged change include reduced government influence on certain commodities and greater concern by producers about conservation, pollution, and the environment in general.

Alternative agriculture covers such concepts as "sustainable," "regenerative," "organic," and "low-input" farming. This whole area represents a certain way of thinking about farming and its link with people and their environment.

These various approaches to agriculture share the same general goal of producing an abundance of safe and nutritious food, in a system sustainable in an economic as well as a physical sense, with minimum adverse effects on the environment, natural resources, and human health.

Regenerative agriculture means improving the total environment, while sustainable agriculture refers more to ensuring continued viability of farms and farming. Organic farming has been defined as production that largely excludes the use of synthetic fertilizers, pesticides, growth regulators, and livestock feed additives.

The meaning of alternative agriculture need not be limited to different ways of producing conventional or traditional crops. It includes not only how crops and livestock are produced but also alternative farm enterprises and nonfarm services, from new crops and livestock products to aquaculture and the leasing of rights to hunt and fish on farmland.

The most profitable level of output on a farm is usually something less than maximum output.

Many Farmers Reduce Inputs

The newest version of alternative agriculture, and possibly the one that has attracted the largest following, is reduced-input or low-input farming. This involves a reduction in the use of manufactured or purchased inputs, often because farmers are seeking ways to reduce costs and minimize their debts. A new mix of inputs typically includes the substitution of labor, management, and machinery for materials such as pesticides and fertilizers.

Substituting crop rotations and livestock enterprises for off-farm nutrient sources will reduce soil erosion and enhance wildlife habitats. Using cultivation instead of chemical weed control and biological instead of chemical insect control appeals to those who seek an environmentally benign agriculture.

Conservation often plays second fiddle to production under conventional agriculture. In alternative agriculture, the need for profitability remains, but the basic idea is to develop a complementarity between conservation and agriculture. Rotating crops, for instance, can cut erosion, generate nutrients, and serve as a means of pest control.

Proponents of alternative and conventional agriculture see conservation tillage through different glasses. Conservation tillage is a way to save soil and raise farm profits. But it also often includes greater use of herbicides to control weeds. A reduction in soil erosion has thus come at the cost of potential contamination of groundwater. The herbicide problem is seen by proponents of conservation tillage as an unwanted but inevitable tradeoff. Proponents of alternative agriculture look for ways to do without more herbicides.

A Reaction Against Tradition

Conventional agriculture is characterized by capital-intensive monoculture (reliance on one or two commodities), continuous cropping, extensive use of credit, and wide use of manufactured inputs such as fertilizer and pesticides.

The culture of conventional agriculture has given production an importance all its own, even fostering the attitude that "more is better." Actually, the most profitable level of output on a farm is usually something less than maximum output. That is, at some point dollar returns from higher increments of output may not cover costs. But this economic reality is sometimes overlooked in a culture that applauds higher yields.

As the 1980's began, conventional agriculture was an increasing source of national pride. Farm exports were making an enormous contribution to our balance of payments. But this success had a price: soil erosion, soil compaction, depletion of groundwater supplies, water contamination by farm chemicals, and the loss of wetlands, forests, and fish and wildlife habitats.

In the early 1980's, financial stress (from downturns in exports, commodity prices, and land values) added to the farming-related problems of resource and environmental quality. Consumer interests and concerns also have been changing. Use of pesticides and other chemicals caused consumers to worry about food safety. And if conventional agriculture excelled at producing abundant food supplies at reasonable prices to consumers, it

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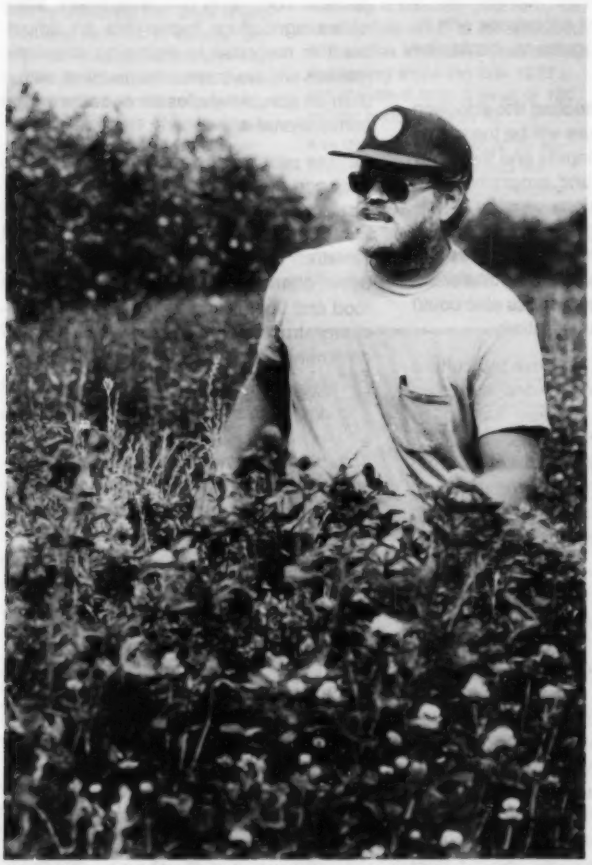
John Myer of Romulus, N.Y., diversified his dairy farm, adding lambs, vegetables, and hay. **(Photos from *New Farm* magazine)**



Steve Moore of California thinned his lemon orchard, and put in a cover crop of clover, which enriched the soil, decreased the need for pesticides, and brought him a premium price for his fruit.

Dick Thompson of Boone, Iowa, is shown here checking organic fertilizer. After he stopped using chemicals on his farm, his profits increased and his livestock had fewer instances of illness.

seemed at times to do so at the expense of food quality.

This combination of problems opened the door to alternative agriculture, which is maturing significantly as it responds. Most of the emotionalism that often resulted from the mere mention of "organic farming" in past years has now waned. Growing numbers of farmers have reduced their reliance on purchased fertilizers and pesticides, not because of any allegiance to environmentalism, but simply as a way to cut production costs.

More and more farmers are now also indicating a concern about health and environmental hazards to consumers and themselves from conventional agriculture. Such problems as contamination of farm wells can have serious effects on farm families themselves. Thus a number of farmers are shifting to alternative agriculture, and one of the reasons is an expectation of increased restrictions on the use of chemicals in the future.

Not a Return to the Past

At the same time, the idealism that has marked organic farming has been tempered by a new reality that an ecologically benign and sustainable agriculture can be maintained in the long run only if it is also economically viable in the short run.

All of this means that alternative agriculture is anything but a return to simple farming methods that rely more on labor and luck than on information and skillful management. Alternative agriculture is not a step backward. It usually requires more information and more sophisticated management skills than conventional farming.

Some farmers are doing their own research and experimentation on alternative agriculture, sharing results through informal networks and field days. Traditions and habits, however, could slow the adoption of new methods. And the land grant-USDA research and extension system that has nurtured conventional agriculture over many decades is just now beginning to develop research knowledge and educational support for alternative agriculture. USDA only recently formed a committee on alternative farming systems to lend support for such research and education.

Expanding research and extension efforts will take time. A big question mark, too, is the speed with which farmers can acquire the sophisticated management skills needed for alternative agriculture.

The 1985 farm bill contained a provision calling for a larger federal role in promoting alternative agriculture. Modest funding of this proposal only came through, however, in appropriations legislation approved in late December 1987. Expansion of alternative agriculture could require new information and services for farmers on everything from weather conditions to marketing options. Past experience with integrated pest management could be helpful in this regard.

Other major forces affecting the adoption of alternative agriculture will be the prices of farm products and inputs and the many government policies and programs influencing farmers' decisions on what to produce and how. Changes in market conditions could either enhance or reduce the attractiveness of alternative agriculture. Export demand and energy prices also could affect these trends substantially.

On the policy side, alternative agriculture will become more and more attractive economically as government loan rates and deficiency payments are reduced. Price supports above market-clearing levels have encouraged conventional agriculture. Environmental protection policies clearly favor adoption of alternative agriculture.

Profitability is all-important. So we need to learn much more about how profitable different versions of alternative agriculture are compared with conventional farming. Little research on such questions has been conducted. We do know that the transition from conventional to alternative agriculture often will involve a drop in yields and lower revenue for several years, despite reduced production costs. Even the most enthusiastic supporters of alternative methods may advise conversion of just one part of a farm at a time.

Weighing the Broader Implications

Questions about management skills, the role of markets and governmental policies, and profitability are probably just the beginning if recent trends in alternative agriculture continue in the years ahead.

Other questions quickly surface: Are certain types and sizes of farms, or particular farm regions, likely to move more rapidly, or more slowly, in adopting alternative farming systems? What changes might be required of the food marketing system, farm support industries, and the economy of rural areas as a result of wider adoption of alternative farm practices and products?

As most commonly practiced today, alternative agriculture represents an adjustment in response to changing economic realities and environmental priorities, rather than an abrupt, wholesale departure from conventional agriculture.

As time passes, however, the adjustments may add up to more significant changes. The possibilities of far-reaching effects in the future point to a growing need for solid research and education on the links between alternative farming approaches and food and fiber markets, farm and input industry structure, the environment, and rural communities.

Curiosity is no longer the main reason for knowing more about alternative agriculture and its effects. Changes in agriculture are occurring at an increased pace and are expected to continue. Ken Cook, conservation writer and consultant, has noted: "The dominant farming systems a half century from now certainly could be much more closely attuned to resource conservation and environmental quality goals than they are today."

No matter how agriculture changes, chances are that what is "alternative" today will be "conventional" tomorrow. So all of us have a stake in the outcome. □

[Written by economist Neill Schaller of the Commodity Economics Division, Economic Research Service.]

REPORTS IN THE NEWS

Australia's Farms Have Global Markets

Australia, the sixth largest nation in total area, boasts only about 15½ million people, but it's a major player in world agricultural markets. Exports of wheat, wool, meats, sugar, and dairy products now reach buyers around the globe, influencing prices and often competing with U.S. products both here and abroad.

The number of Australian farms—a mere 176,000 in 1985—is declining. Average farm size is over a thousand acres, mainly reflecting the large sheep and beef ranches in remote, dry regions. Australia is the world's largest exporter of wool and live sheep, and it ranks among the top five exporters of beef, sheep meat, wheat, barley, and sugar.

This report presents a statistical profile of Australian agriculture, with data on production, crop acreage and yields, livestock numbers, consumption, prices, and trade for the country's major farm commodities. Here are a few highlights:

- Wheat production is extremely variable. In the first half of the 1980's, annual harvests ranged from a low of 8.9 million tons to a high of 22.0 million.
- Red meat production rose from around 1.1 million tons in the early 1950's to 2.9 million in 1977/78. By the mid-1980's, output had dropped to about 2.1 million tons, reflecting a sharp decline in beef production.
- Sheep outnumber people by ten to one. The herd, at an estimated 156 million in 1985/86, has been expanding since the late 1970's, but it's down from a peak of 180 million head in 1969/70.
- In the past, the bulk of its exports went to Europe and the United States. Today, Australia finds customers in Asia, the Mideast, Eastern Europe, and elsewhere. In recent years, the USSR has bought large quantities of Australian wool, wheat, and sugar.

Agricultural Statistics of Australia *by Nina Swann. (Published Dec. 1987; 86 pages of mostly tabular data; GPO Stock No. 001-019-00549-1; $4.50.)*

Corporate Farms Have Family Ties

Statistics on "corporate farms" have sometimes been viewed as an ominous sign that American family farms are being swallowed up by giant, nonfarm conglomerates. Such cases exist, but their frequency cannot be measured by counting up the number of farm corporations.

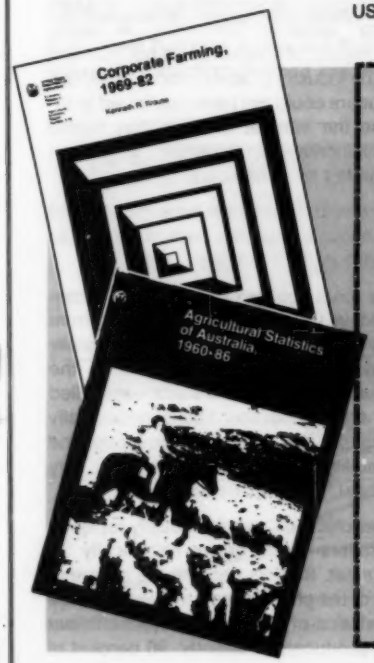
It's true that corporate farms tend to be larger than the average U.S. farm and that large-size farm corporations dominate production of a few commodities, including fruits, nuts, broilers, and sugarcane. It's true, too, that the number of U.S. farm corporations climbed from 21,513 in 1969 to 59,792 in 1982, based on Census of Agriculture data. That's about 2.6 percent of all U.S. farms.

Yet it's also true that most of the farms with "Inc." on their names are existing family-owned farms that have incorporated for the tax advantages or other benefits offered by the corporate form of organization. In 1982, nine out of every ten farm corporations reported that they were family-held farms.

In this report, economist Kenneth Krause analyzes corporate farm trends between 1969 and 1982.

According to Krause, the rate of farm incorporation appears to be slowing in the 1980's. Tax reductions in 1981, the tax reform legislation of 1986, liberalized estate tax laws, and changes in the farm financial picture have all reduced the incentives for incorporation.

Corporate Farming, 1969-82 *by Kenneth Krause. (Published Dec. 1987; 22 pages of text and tabular data; GPO Stock No. 001-019-00547-5; $1.50.)*



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U.S. Broiler Industry Is Still Expanding

The agricultural industry that puts billions of pounds of chicken on consumers' tables each year often seems more like a factory assembly line than part of the U.S. livestock sector.

This highly integrated, efficiency-conscious industry virtually exploded with growth after specialized broiler operations emerged in the late 1930's and early 1940's. Unlike the more diverse beef and hog industries, broiler production is now dominated by a handful of operators, most of whom control their products from incubation to retail.

The broiler sector also differs from the two other major meat sectors in that the first point of sale typically occurs not at the farm, but later, when the dressed, cut-up, or ready-to-cook bird is sold to a wholesaler or retailer.

Fast-paced technology is one reason the industry evolved away from the Norman Rockwell-like picture of the farmyard chicken coop. Improved genetics, better balanced rations, and environmentally controlled housing increased producers' efficiency in raising chickens. This helped the industry produce large amounts of economically priced product and capture a greater portion of the market for meat.

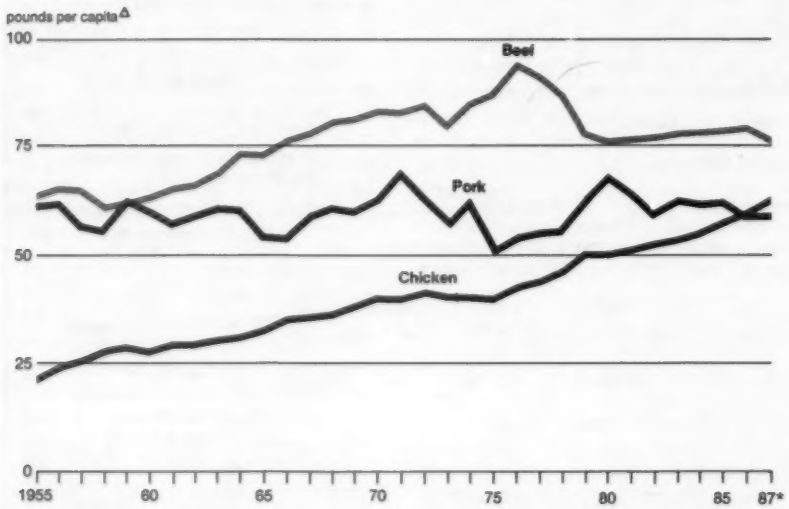
Broilers alone now account for 26 percent of all meat consumed, up from 14 percent in 1960.

Growers now turn out heavier birds in less time. On average, a broiler weighing 3.5 to 4.5 pounds can be produced in 7 to 8 weeks, about half the 12 to 14 weeks it took 30 years ago. Feed conversion rates have also improved. It now takes about 2 pounds of feed or less to grow a pound of broiler, down from 4 pounds of feed in the 1940's.

The result is that the average time it takes to raise a brood—a group of birds—to slaughter is nearly 2 weeks shorter than a decade ago, allowing growers to produce an extra brood every year. Most producers turn out more than 6 broods annually, says Lee Christensen, an economist with USDA's Economic Research Service.

Behind the increase in production has been a corresponding rise in consumption. Much of it occurred while meat consumption levels in general were climbing. Now, however, overall meat consumption is leveling off, while broiler consumption continues to rise.

Per Capita Consumption of Chicken Has Surpassed Pork and Is Catching Up With Beef



△Retail-weight basis for beef and pork; ready-to-cook basis for chicken. Chicken includes broilers and other chicken meat.
*Estimated.

Controlling Production

The success of the broiler processors—the firms that control most of the production—can be attributed, at least in part, to the ease with which they adjust output in response to market demand. But the industry's market share also relates to the improved quality and availability of broilers, changing consumer preferences, and favorable retail prices. Broilers alone now account for 26 percent of all meat consumed, up from 14 percent in 1960.

But which came first—production or consumption—is something of a "chicken or egg" question. Obviously, per capita consumption of chicken could not increase until the industry produced more birds. But producers could not have continued to increase the number of birds they raised without increases in the amount of chicken demanded by consumers.

In all, consumption grew more than 29-fold from about 2 pounds a person in 1940 to an estimated 60 pounds in 1987.

"Fifty years ago, most of the chicken consumed in the United States came from 'other chickens' which were not specifically raised for meat. These birds were the surplus hens and roosters that were culled from egg production flocks periodically throughout the year. Consequently, the availability of chicken at retail was very seasonal," says Christensen.

"Other chickens" were gradually replaced by broilers—birds grown specifically for their meat. Broilers became the source of most of the chicken meat we eat because new strains of egg-layers were inefficient meat producers. Currently, 96 percent of

all chicken eaten in the United States is broiler meat.

As broilers became the meat animals of the chicken house, the industry was specializing and concentrating. It evolved from the independently owned, small-flock operations that marketed chickens through small processors scattered across the country to a highly integrated industry dominated by relatively few processors. According to Christensen, these firms are located primarily in northwestern Arkansas, northern Georgia and Alabama, central Missouri, eastern Texas, the Delmarva Peninsula, North Carolina, and central California.

"In 1984, 134 firms—operating 238 federally inspected plants—processed more than 4 billion birds weighing nearly 18 billion pounds. The four largest firms during that year operated 41 plants that slaughtered 33.7 percent of all the broilers produced," says Christensen. In 1964, 201 firms—operating 320 plants—had slaughtered one-third fewer chickens.

Yet while the trend has been toward increased concentration, the same processors have not consistently remained the largest. An industry publication, *Broiler Industry,* publishes an annual list that tracks the changes in industry rankings. Between 1976 and 1985, three different firms were listed as the number one broiler processor. Eight were listed in the top four in different years, and 13 separate firms appeared in the top eight during the period.

One reason for the fluctuation among top processors was the number of mergers within the industry. Such activity, while it has slowed in recent years, will likely continue to contribute to the general increase in processor size, Christensen says.

Most of these large firms control more than one aspect of the industry. Many control their products from the production cycle, through the processing phase, and into retail stores. According to the economist, a typical firm might include a hatchery, feed mill, processing plant, and field service, management, and marketing staffs. The

birds are grown under contracts with growers who provide the facilities and management. Typically, it takes 150-300 contracts to fulfill one processor's annual needs.

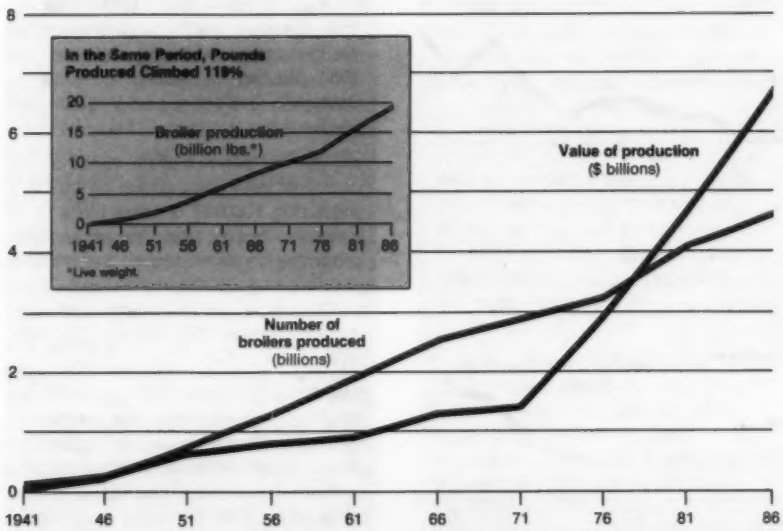
A Changing Industry

"The industry's integration—through direct ownership and contracts—has tied several stages of production and marketing together so there is often no longer sales transactions taking place at the farm level," Christensen says.

The farmer—or grower—level of the industry has also seen changes, including concentration. The 1982 agricultural census showed 30,100 farms producing broilers, down from 42,185 in 1959. But while farm numbers fell, total output rose, from 1.4 billion birds to 3.5 billion in the same period. The average number of broilers raised per farm jumped from 33,637 to 116,844, mainly because each farm expanded its size and produced more broods each year, Christensen says.

The number of farms that annually sell more than 100,000 birds reached 13,214 in 1982. These enterprises controlled 89 percent of production. In 1959, there were only 2,254 of these large farms, and they accounted for less than 29 percent of the production. Bucking the trend toward fewer but larger farms were those operations that raise fewer than 2,000 birds a year. These farms nave increased slightly in number in

In the Last 20 Years Alone, the Number of Broilers Produced Rose 81%, and Value of Production Jumped 394%



recent years, perhaps as a result of a rise in hobby farms or as a means to supplement an existing operation's income.

Growers have also seen change with the introduction of new feed formulations, improved broiler strains, and advanced vaccines and medications. The developments not only raised growth rates, but also reduced broiler mortality rates from levels of 10 to 20 percent 30 years ago to today's mortality rate of 3 to 5 percent.

Improved facilities—such as controlled-environment grower houses or hatcheries—have also contributed to greater efficiencies. With these facilities, birds grow at a more consistent rate throughout the year.

Today, broiler houses are generally 30 to 40 feet wide, 250 to 500 feet long, and made of wood or metal. The roofs are usually insulated, and the dirt floors are covered by deep litter. Conventional, open-sided houses have curtains that can be raised or lowered to help regulate the temperature inside the building. Thermostats and exhaust fans—either mechanically or automatically operated—also are used to maintain a healthy environment for the birds.

Environmentally controlled houses—more often found in northern regions where cold, inclement weather can easily raise death counts—are entirely enclosed, windowless buildings that incorporate insulated walls and roofs, and exhaust fans for forced ventilation.

"While these enclosed, self-contained buildings offer more protection for birds in colder climates, they do have their drawbacks. Considerable supervision and monitoring are needed with the systems. For example, in the event of a power failure, heavy death losses can result because the birds can easily suffocate if ventilation shuts down and the air supply is cut off," says Christensen.

The combined effect of improved nutrition, genetics, health care, and facilities helped push the amount of broilers processed by the industry to nearly 18 billion pounds of liveweight in 1984, almost triple the 6 billion pounds that went through the plants in 1961. In fact, output has increased in all but 5 of the past 50 years.

Increases in Further Processing

Besides the overall volume increase, the processing sector has seen an increase in the amount of chicken that undergoes further processing. According to Economic Research Service data, around 60 percent of all broilers are further processed—from having a thermometer inserted in a roaster to having a whole bird cut up and prepared for convenience food.

Most of the processors cut up chicken at one or more of their plants. In 1984, only 41 of the processors did not add value to their products by cutting the whole birds into parts or otherwise extending processing. Much of this further processing occurs in specialized plants that often process other meats. And while there are a greater number of firms than in the past that focus on further processing, the majority of this production is even more concentrated than the broiler industry as a whole. The top four further-processing firms account for 41 percent of the value-added production, says Christensen.

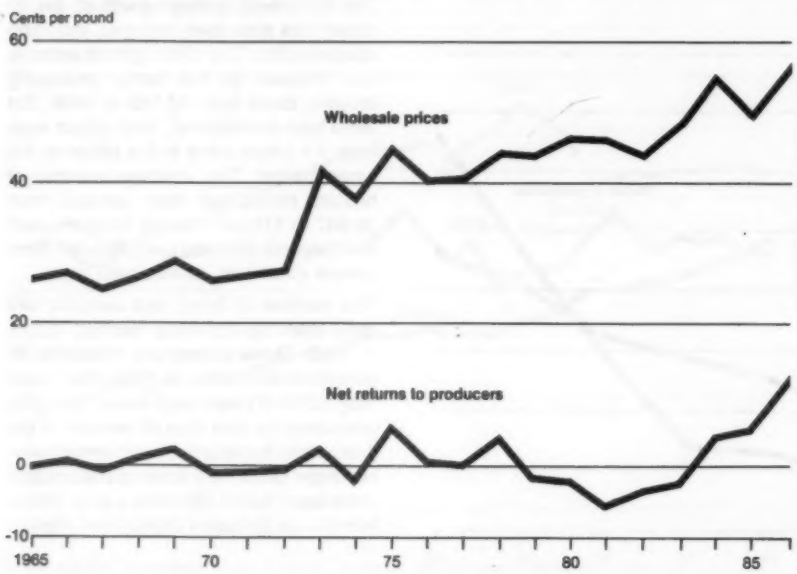
The increased interest in further-processed chicken stems from processors responding to changing consumer demands and tastes. Furthermore, products such as cut-up chicken parts, ready-to-cook barbecued chicken, and stuffed chicken breasts increase processors' sales and revenues. Products developed for restaurants and other "foodservice" outlets allow processors to reach another market.

Years ago, firms that specialized in simple, single-item menus, like Kentucky Fried Chicken, dominated the fast food market for chicken. "Now most firms sell at least one chicken product. Many chains require special products, like deboned, filleted, or breaded parts," says Christensen.

It is in this area that the industry is expected to see continued expansion. Value-added and further-processed products help smooth out returns with increased sales of the products that are not easily affected by changing market conditions, the analyst explains.

Domestic demand is not the only factor that has prompted increased production. The United States also exports a substantial

Wholesale Prices of Broiler Chickens, As Well As Net Returns, Were at Peak Levels During the Mid-1980's



Broiler Producers Mostly in South

Eight out of every 10 U.S. broilers are produced in the South or along the East Coast. Arkansas, Georgia, Alabama, and North Carolina were the four major producing states in 1984. Mississippi, Maryland, Texas, Delaware, California, and Virginia filled out the top ten.

Eighty-nine percent of the broilers raised in 1984 were grown on farms producing 100,000 or more birds annually. Twenty-nine percent were produced on farms raising between 100,000 and 200,000 birds, and 44 percent were raised on farms producing between 200,000 and 500,000 birds.

The South produced 66 percent of the 1984 supply. Producers on the Delmarva Peninsula and in Virginia's Shenandoah Valley accounted for 14 percent, California 4 percent, and other regions 16 percent.

amount of chicken. Between January and October 1987, total U.S. exports of chicken meat reached an estimated 638 million pounds. According to Christensen's ERS colleague Larry Witucki, that was more than a 40-percent increase above the 453 million pounds exported in the same months of 1986.

In addition to opening another outlet for U.S. chicken, foreign sales open markets for dark chicken meat. As Elbert M. Boyd, Jr., president of a major poultry exporting firm, E. Boyd Associates, Inc., said at USDA's Agricultural Outlook Conference last December, "The peak demand here at home has been for white meat, with dark meat generally in surplus. This surplus has been very compatible with the export markets since a large percentage of our export customers prefer dark meat."

According to Boyd, the market for chicken exports should remain strong because of low chicken prices and the U.S. dollar's low value compared with many of our trading partners' currencies. Furthermore, transportation costs are reasonable, and the U.S. Export Enhancement Program is helping to promote chicken exports. However, obstacles—like the added expense of servicing foreign customers, import duties and taxes, and the stringent quality, packaging, and labeling standards imposed by other countries—must be overcome.

Meeting Challenges

The industry must also overcome long-standing problems at home. Disease outbreaks, such as the avian flu that caused considerable economic losses on the East Coast in 1983-84 and again in 1986, are an ever-present threat and require constant monitoring.

Another challenge to the industry is posed by the traditional price-supply cycle that prompts industry decisions on how many chicks to place for future production. It will continue to cause swings in net returns, partly because the industry over-responds to profitable prices with large expansions in production, and to poor prices with big reductions.

"Net returns will continue to be volatile as overall meat supplies affect retail prices and as changing input prices affect total production costs," Christensen says.

But chicken consumption, fueled by a growing population and per capita consumption levels, will probably continue to climb for a number of years, he adds. Population alone—projected to reach 268 million by 2000—will account for a 1-percent annual increase for the next decade and a half. Poultry consumption may rise 2 to 5 percent a year, perhaps reaching 67 pounds a person by 1990 and 95 pounds a person by the turn of the century under the most optimistic forecasts.

Much of the consumption increase will be in new, value-added products, says the economist. Greater use of microwaves, higher family incomes, and more eating out will all add to continued industry growth. And while the emphasis on value-added sales will narrow the price gap between chicken and other meats, chicken will maintain a fairly strong price advantage over its competition.

The industry, however, will not be readily open to entrants, so most of the increase in broiler volume will come from existing firms, says Christensen. "New firms cannot afford to jump into the business of raising chickens. The capital investment needed to establish new broiler production and processing facilities is very large, and would be undertaken only after careful analysis," Christensen says. □

[Based on information provided by economists Lee Christensen and Larry Witucki of the Commodity Economics Division, Economic Research Service.]

Contract Growing Is the Standard

How do processors get enough broilers to meet their needs? Through production contracts with producers who own or operate grow-out facilities.

Approximately 92 percent of all broilers are grown under contract, says Economic Research Service economist Lee Christensen. The remaining 8 percent are raised on farms operated by vertically integrated processors.

"Production agreements usually require growers to supply housing, equipment, labor, water, and some of the fuel and litter," the economist says. "For these services, the grower is paid a per-pound price set when the contract is issued. Some contracts are based on how many birds are sold. A few provide weekly payments for grower facilities whether or not they are in use."

The integrators—or processors—supply breeder stock, chicks, feed, medical supplies and veterinarian services, and some of the fuel and litter. Their field staff visit growers' farms weekly to help resolve problems concerning health, nutrition, or production. Bonuses may be paid to growers if the performance of their flocks is better than that of others. Often, such bonuses are tied to feed conversion rates because the better weight gain per pound of feed, the more money the processor saves on feed.

A typical bonus, according to Christensen, would be half a cent to 1 cent a pound for growers who achieve above-average feed conversion rates. For instance, assume that a grower—with a 40-by-400-foot house that accommodates 21,000 birds—has a 3-percent death rate for his brood. If his birds average 4 pounds when marketed, he could produce more than 81,000 pounds of broilers in one growing cycle. With a bonus of 1 cent a pound, he would earn an additional $800 or more above the base price for his brood. If he produced five broods a year and his base payment was 4¢ a pound, he would earn an additional $4,100 and increase his income by 25 percent.

These contract arrangements allow processors to control the timing and magnitude of the flow of poultry into their plants, and consequently to market. However, they can pose problems for growers. The records and rankings allow processors to subtract penalties from growers whose flocks fail below average in feed conversion rates.

In addition, processors may hold back contracts, and hence chick placements, to correct an oversupply of broilers. Some growers may then be left with empty facilities that must still be paid for. Christensen also notes that growers with the poorest performance records, oldest facilities, or most distant locations from the feed mill are the most likely ones to bear the brunt of contract reductions when processors cut back.

Nevertheless, growers do benefit from these contractual arrangements. Most of the price risk for the finished product—a 4-pound live bird—is absorbed by the integrator when contract prices are set. The grower, therefore, has an indication of how much his income will be. In addition, though growers may lose income because of diseases or deaths in the flocks, the integrators risk the actual cash loss since they generally retain ownership of the birds.

Effects of Immigration Law Still Uncertain

Last year, U.S. producers of "perishable" crops were wondering whether enough workers would be available in the wake of the new immigration law.

Although some spot shortages of farmworkers were reported in the spring, no evidence of widespread, labor-related crop losses was apparent in the nation's 1987 fruit and vegetable harvests.

Nevertheless, the concerns remain. Another harvest season is now settling in, with the coming warmth of spring and summer, and again the question arises: How will the immigration law affect the overall supply of workers, including illegal foreign workers, in agriculture?

This question will never be answered with numerical precision because there is no accurate measure of the number of illegal aliens who've been working on American farms, says economist Robert Coltrane of USDA's Economic Research Service.

Whatever the effects of the law, however, growers may not feel the full impact for another year or more, he adds.

This year, immigration officials are likely to be targeting their enforcement efforts on other industries because the Immigration Reform and Control Act of 1986 exempted many agricultural employers from any penalties (until Dec. 1, 1988) for knowingly hiring illegal aliens.

"The real test is likely to come after that time," says Coltrane, "when penalties can be imposed and immigration investigators may take a more aggressive approach to agriculture."

Border Measures Are in Force

That doesn't mean the number of illegal aliens will be as high as it has been in the past.

Bolstered by manpower increases, both the Border Patrol and the other investigative arms of the Immigration and Naturalization Service (INS) are poised to trim the flow of illegals entering the United States, while intensifying efforts to track down those who are already here.

Illegal aliens are still subject to arrest and deportation, and they still have to get across the border and get to the farm. Even if they live in this country, they must travel to get to the farms where they'll be working.

To avoid penalties, farm employers will have to learn to use the provisions in the law to obtain the workers they need.

Any farmers tempted to turn to illegal aliens, therefore, are likely to find fewer in the labor force.

The other uncertainty—for growers who depend on seasonal labor to harvest "perishable" crops—is the degree to which newly legalized workers will want to stay in agriculture. Agricultural employers are counting on many of the illegal aliens they've employed in the past to convert their status (to a legal one) and come back for this year's harvest.

In this regard, employers may be relying heavily on the special agricultural worker (SAW) provision of the law. It enables certain foreign farmworkers who have been employed here in the past to qualify as legal workers.

Only "SAW" Producers Exempt

The SAW provision is also the key one in terms of the exemptions from penalties (until December) for certain agricultural producers. It applies only to producers who grow the defined "perishable crops." They are temporarily exempted from the penalties for knowingly hiring illegal aliens or for failing to fill out an I-9 form used to verify the legal status of each worker.

In administrative regulations issued by USDA after the November 1986 passage of the law, "perishable" crops included in the SAW program have been broadly defined. They include not only fruits and vegetables, but also wheat, sugar beets, and many other commodities.

Coltrane says the main crops not qualifying as SAW commodities are cotton, sugarcane, sod, hay, forage and silage, seed intended solely for seed use, flax, millet, and sorghum. Livestock producers are also not covered by the SAW provision. Employers who produce these commodities have been subject to penalties since May 1987, if they have not complied with the new law.

The pool of SAW workers has been growing, though their numbers are still relatively small compared with agriculture's labor needs. In the first 8 months of signup—from June 1987 through January 1988—around 260,000 workers filed SAW applications to take the first step on a path that leads to temporary legal residency, and eventually, American citizenship.

Moreover, the temporary rules that relaxed border controls last year to bring in farmworkers have been extended to ease their return this year. Three special ports of entry for SAW workers have been designated, and such workers simply have to present a completed application to receive a 90-day work authorization in the United States.

Supporting documentation proving the worker performed farm labor in the United States in past years—thus becoming eligible for the SAW program—must be submitted during that 90-day period.

However, as of December 1987, only 2 percent of the SAW applications had been filed from outside the United States. This means that the relaxed border restrictions have not, as yet, had much of an impact on the supply of foreign workers.

In addition, Coltrane cautions that SAW workers are not required to remain in agriculture.

"Once farmworkers receive their work authorization card, they can work wherever they want, in whatever industry they want," he says. "Agricultural employers have no assurance that the workers will stay in agriculture."

Amnesty and H-2A Are Other Sources

The SAW workers in the legal labor force will be supplemented by other former illegal aliens who have qualified for U.S. residency under the immigration law's legalization, or "amnesty," provisions. These are people who can prove continuous

residence in the United States since at least the end of 1981, and who can show that they would not become "public charges" if allowed to remain in the United States.

Another source of legal labor authorized by immigration reforms is the H-2A program, under which foreign farmworkers are recruited to come to the United States to work for a specified employer and time period. These workers are not put on any path to residency or citizenship, and must go back to their country of origin once the contract is fulfilled.

So far, though, the H-2A program has not been used extensively by farmers, perhaps because of the time-consuming application process, the strict regulations of the program, and the uncertainty last year about the supply of workers, says Coltrane.

Beginning in October 1989, farmers can also tap the so-called "replenishment" farmworkers. Under this provision, farmworkers would be allowed to enter the United States to replace newly legalized SAW workers that might have shifted to other occupations, if there is a shortage of workers to produce and harvest the "perishable" crops. The new workers will be required to work in crops included under the SAW program for at least 90 " man-days" per year in each of the first 3 years of residency in order to remain in the country.

"If they do this," says Coltrane, "they will become permanent residents. If they continue to work 90 man-days in the covered crops for 2 additional years, they can qualify for U.S. citizenship."

All of these programs, according to Coltrane, are examples of the special provisions made for agriculture in the immigration law. The implementation of the law, with relaxed border controls for agricultural workers and delayed penalties for many growers, also demonstrates concern over assuring an adequate labor supply to agriculture.

Nevertheless, he says, immigration reform will force adjustments by many producers who have traditionally depended on illegal workers. The law is intended to stem the flow of illegal aliens and gain control over the nation's borders. To avoid potential penalties, farm employers will have to learn to use the provisions in the law to obtain the workers they need, Coltrane says. □

[Based on information provided by economist Robert Coltrane of the Agriculture and Rural Economy Division, Economic Research Service.]

Farm Wage Rates Likely To Rise

One of the changes growers of perishable products may ultimately face as a result of the immigration law is an increase in farm wage rates.

According to many commodity analysts, wages are almost certain to rise with a clampdown on illegal workers in both agricultural and nonagricultural industries, and increased reliance on domestic workers. Farmers probably can expect greater competition from the nonfarm economy for the supply of workers available.

For some sectors of agriculture, higher labor costs could aggravate current problems in maintaining market shares against competitors.

"The recent U.S. immigration law, now being implemented, may result in an even wider wage disadvantage than currently exists between the U.S. and foreign growers and processors," says economist Boyd Buxton of USDA's Economic Research Service.

The possible consequences: Countries with lower labor costs might pick up more of the lucrative fruit and vegetable trade in world and U.S. markets. The United States has already been losing market shares in these commodities over the last 4 years.

One option for farmers trying to control costs is further mechanization. "Mechanization is one method that is always mentioned when discussing ways to offset higher wage rates," Buxton notes. But he says this option may be practical only for some commodities.

"There are items, such as citrus for processing, where mechanization may have possibilities," says Buxton, "but it is almost impossible to mechanize some other commodities."

He says strawberries, table grapes, citrus fruits, and peaches, pears, and apples intended for fresh use are some of the important items unlikely to be mechanically harvested anytime soon.

Commodities that bruise easily, or because of differences in maturing characteristics require harvesting several times a season, need to be harvested by hand, Buxton says.

Many producers, though, may find some help in the immigration law itself. Its special agricultural provisions allow foreign farmworkers to gain legal status or to be brought into the United States for agricultural work.

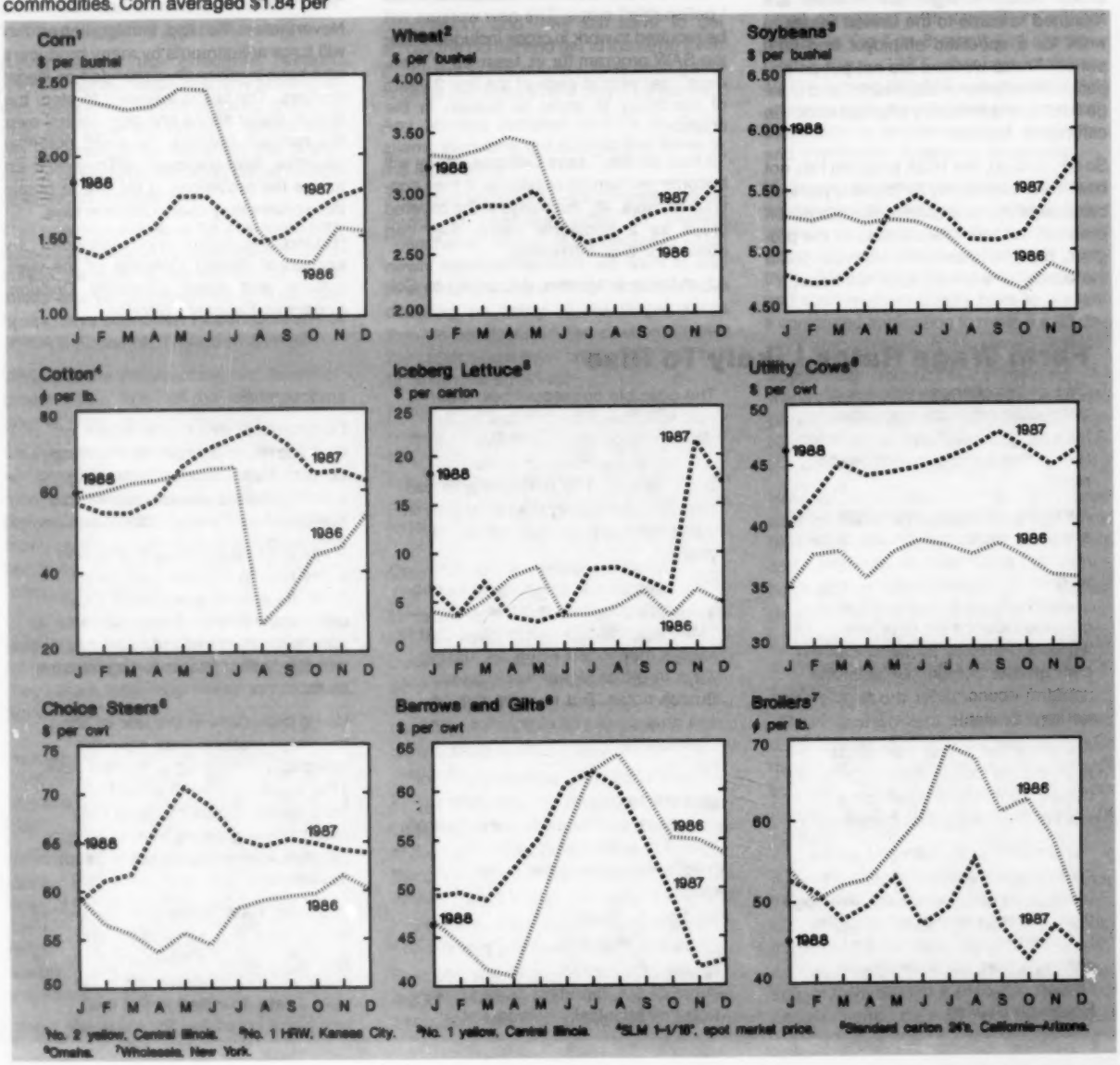
Using provisions in the law to bring in foreign workers may ease the potentially tight supply, Buxton says. That could help keep labor costs from increasing as much as they might rise if growers tried to attract enough domestic workers to fill all the jobs.

However, SAW workers are protected by the laws that apply to American workers, including minimum wage laws, and H-2A workers must be paid a rate specified in the law.

FARMLINE TRENDS

Monthly Price Monitor

USDA's January 1988 index of farm prices increased 2.4% from December and was 7.4% above its year-earlier level. Compared with January 1987, the year began on a favorable note for most commodities. Corn averaged $1.84 per bushel, up 40¢ from a year earlier, while wheat was up 50¢ to $3.21. For the first time in 38 months, soybeans topped $6, compared with $4.80 at the start of 1987. Cotton, at 59.7¢ a lb., was up 2.5¢, and lettuce was nearly triple its year-ago price. Among meat animals, utility cows sold for $46.17 per cwt and choice steers for $65.00. Both were priced $6 above their year-earlier levels. Barrows and gilts, at $46.28, were down $3 from January 1987, and broilers were down 7.5¢ per lb. to 45.2¢. All prices shown are monthly averages.



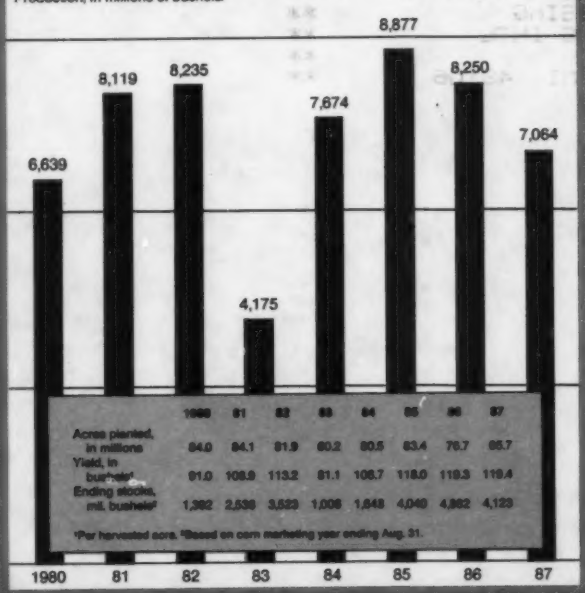
[1]No. 2 yellow, Central Illinois. [2]No. 1 HRW, Kansas City. [3]No. 1 yellow, Central Illinois. [4]SLM 1-1/16", spot market price. [5]Standard carton 24's, California-Arizona. [6]Omaha. [7]Wholesale, New York.

Harvests of the 1980's

Corn, Wheat, Soybeans, Cotton

Corn

Production, in millions of bushels:

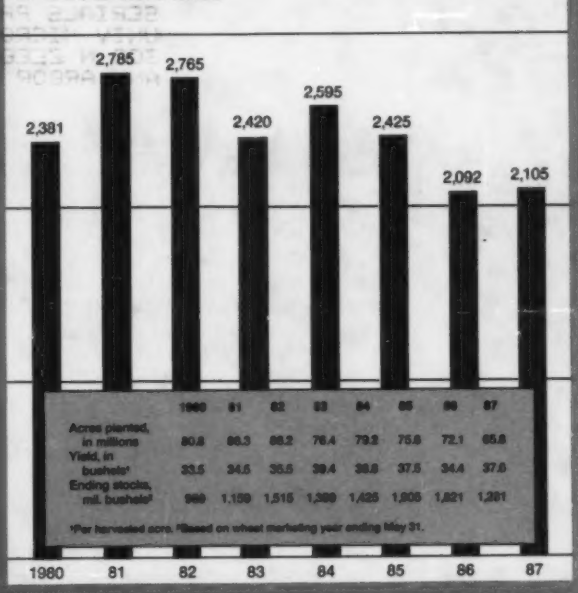


	1980	81	82	83	84	85	86	87
Acres planted, in millions	84.0	84.1	81.9	60.2	80.5	83.4	76.7	66.7
Yield, in bushels[1]	91.0	108.9	113.2	81.1	108.7	118.0	119.3	119.4
Ending stocks, mil. bushels[2]	1,302	2,536	3,523	1,006	1,848	4,040	4,862	4,123

[1]Per harvested acre. [2]Based on corn marketing year ending Aug. 31.

Wheat

Production, in millions of bushels:

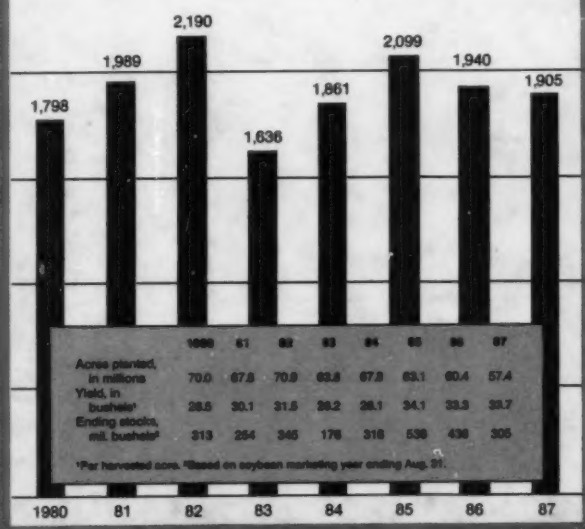


	1980	81	82	83	84	85	86	87
Acres planted, in millions	80.8	88.3	88.2	76.4	79.2	75.8	72.1	65.8
Yield, in bushels[1]	33.5	34.6	35.5	39.4	38.8	37.5	34.4	37.6
Ending stocks, mil. bushels[2]	949	1,159	1,515	1,369	1,425	1,805	1,821	1,281

[1]Per harvested acre. [2]Based on wheat marketing year ending May 31.

Soybeans

Production, in millions of bushels:

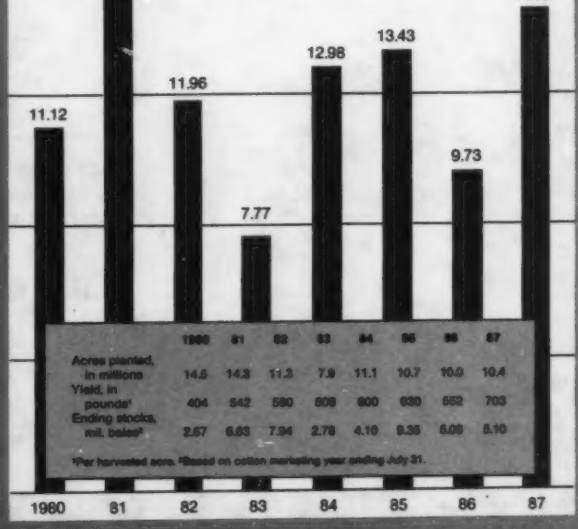


	1980	81	82	83	84	85	86	87
Acres planted, in millions	70.0	67.8	70.9	63.8	67.8	63.1	60.4	57.4
Yield, in bushels[1]	28.5	30.1	31.5	29.2	28.1	34.1	33.5	33.7
Ending stocks, mil. bushels[2]	313	264	345	176	316	536	436	305

[1]Per harvested acre. [2]Based on soybean marketing year ending Aug. 31.

Cotton

Production, in millions of bales:



	1980	81	82	83	84	85	86	87
Acres planted, in millions	14.5	14.3	11.3	7.9	11.1	10.7	10.0	10.4
Yield, in pounds[1]	404	542	580	809	600	630	552	703
Ending stocks, mil. bales[2]	2.67	6.03	7.94	2.78	4.10	9.35	6.09	5.10

[1]Per harvested acre. [2]Based on cotton marketing year ending July 31.

Data provided by economist Bern Evans and other crop analysts of the Economic Research Service and statisticians of the National Agricultural Statistics Service.

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